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# SAFE GUARDS

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**ACCIDENT PREVENTION SERIES No. 7**

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issued by

**Government Employees Compensation  
Branch**

*Canada* **Department of Labour**  
1961

**Hon. Michael Starr**  
Minister

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Deputy Minister

## SAFE GUARDS

The elimination and physical guarding of hazards in the shops and laboratories is a prime requisite of any safety program. It also indicates, to the workers, administration's desire to provide safe working conditions.

Guards are usually constructed of wood, sheet metal, cast metal, expanded metals, perforated metal and woven wire. Other materials such as fibre board, transparent plastics, etc., are frequently used.

The requirements of a good guard may be summarized as follows:

- (a) The guard must afford maximum protection including protection in the event of the failure of the part guarded.
- (b) It must not interfere with the efficient operation of the machine.
- (c) It must be so designed and constructed that the enclosed parts are easily and safely accessible for lubrication, repairs or routine changes.
- (d) It must be durable; strong enough to withstand ordinary wear and also abuse.
- (e) The guard should be attached to the machine and not to the floor; if attached to the floor, use a

connection which will interfere as little as possible.

The framework is usually made from angle iron, iron pipe, bar stock, or wood. The filler is usually constructed of sheet, perforated or expanded metal, woven wire, fibre board, plywood, plastic or shatterproof glass.

Materials used in guards should be free from burrs and sharp edges. Wire mesh should be of a type in which the wires are fastened at each cross point by welding, soldering, or galvanizing, except in the case of diamond or square mesh made of 14 guage wire  $\frac{3}{4}$ -inch mesh or heavier.

If the guard is to be rigidly secured to some part of the machinery or building structure, the frame should be made of angle iron 1-inch by  $\frac{1}{8}$ -inch, metal pipe with  $\frac{3}{4}$ -inch inside diameter or metal construction of equivalent strength. The guards should be braced at 3 foot intervals to some fixed part of the machinery or building structure.

If the guard is to be secured to the floor or to a working platform without other support or bracing, the frame should be made of  $1\frac{1}{2}$ -inch by  $\frac{1}{8}$ -inch angle iron, metal pipe with  $1\frac{1}{2}$ -inch inside diameter or metal construction of equivalent strength.





Metal is preferable to wood except for guards to be used where chemicals or fumes would tend to deteriorate or corrode metal. In such instances, corrosion resistant metals or wood guards are recommended. The disadvantages of wood guards are that they increase the fire hazard, are more expensive in upkeep and will not withstand as much wear and impact as metal guards. Recent developments in waterproof plywoods and adhesives have permitted the use of plywood guards which do not splinter or come apart.

The material and construction of wood guards should conform to the following specifications:

- (a) The wood should be sound, tough and free from loose knots.
- (b) Guards should be made of planed lumber not less than 1-inch by 4-inch board measure, with the edges and corners rounded off.
- (c) Dowel pins, screws or bolts rather than nails should be used as fastenings for wood guards; if the wood dries, nails tend to become loose and weaken the guard or cause injury.
- (d) Material for the framework and filler material should have the strength and rigidity specified for metal guards.

Frequent and regular inspections should be made of all power transmission apparatus and its appurtenances to make sure that they are in proper working condition and so guarded that no one will be injured by accidental contact.

As a general rule, any shaft, belt, pulley, gear, coupling, etc., which is within  $8\frac{1}{2}$  feet or less of the floor or working platform, except runways used exclusively for oiling or making adjustments, should be substantially encased with stationary guards. Shaft ends which project beyond a bearing or hub should be cut off flush or guarded by a nonrotating cap or safety sleeve. Unused keyways should be filled up or covered.

Stairways and elevated walkways should be equipped with handrails and toe boards.

Windows immediately adjacent to stairways or ramps should be covered with heavy wire screens.

Doors that open out, onto or into, shafts, etc., should be kept locked and be provided with warning signs. As an extra precaution they should be provided with additional rail or screen barriers.

Open pits such as motor pits, sumps, etc., should be railed off with standard railings.





Steep ramps should be surfaced with non-slip cleats or paint.

Lights should be provided in dark corners or areas.

Projections into aisleways or walkways should be railed off or painted with some contrasting colour.

Changes in floor level should be clearly defined.

Power saws (including band saws), shapers, drills, etc., should have the point of operation guarded.

Temporary guards are sometimes necessary in the relocating of machinery or installing and testing of new equipment. Such temporary guards should give the same protection and except for appearance, should conform as closely as possible in strength, rigidity and clearances to the specifications for permanent guards.